

Inequality in Domestic Violence, Case Study: Egypt and Jordan

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1- Introduction:

Domestic violence refers to “aggressive behaviors that adults use against their intimate partners,”(Holden, 2003) and includes the following: physical aggression (e.g., beating, slapping, hitting, and kicking etc.), psychological abuse (e.g., acts of intimidating, belittling, and humiliating etc.), sexual violence (e.g., forced sexual congress and other forms of sexual abuse), controlling behaviors (e.g., restricting a partner’s communication with family and friends, monitoring a partner’s actions, and restricting a partner’s access to sources of information; WHO, 2005).

According to two studies in North America and Europe, both males and females experience physical and psychological domestic violence: however, males deploy physical violence more harmfully, and are likelier to hurt and commit sexually assault; violence by females tends to be stimulated by fear or self-defensive, and female violence results in particularly harmful psychological outcomes (Langhinrichsen-Rohling, 2010; Straus, 2004; Swan et al., 2008). According to Morse (1995), relative to men, women likelier to experience domestic violence, and to sustain more severe injuries in that context. As a result, domestic violence is an asymmetric phenomenon, and in most cases, adversely affects women.

Domestic violence against women is a worldwide problem, largely because of its health consequences for women, their children, their families, and society as a whole. According to the April 2018 report from the World Bank, 35% of women worldwide have experienced physical or sexual violence at the hands of intimate partners or men who are not partners.

Among African women, the lifetime prevalence of physical domestic violence ranges from 17% to 48% (Jewkes et al., 2001; Kishor and Johnson, 2004); in Colombia, Peru, and Nicaragua, the proportion of married women who have experienced physical violence ranges from 40% to 52% (Ellsberg et al., 1999; Kishor and Johnson, 2004). In South Asia, lifelong levels of domestic violence against women are equally high (Koenig et al., 2003). There has been scarce research conducted on domestic violence in the Middle East, but one-third of married Egyptian women report being beaten by their husbands, and 30% of Israeli Arab women report having suffered physical or sexual abuse by an intimate partner (El-Zanaty & Hussein, 1995; Haj-Yahia & Edleson, 1994).

WHO (1997) cites seven main factors contributing to domestic violence against women, as

follows: a familial history of violence, alcohol use, personality disorders, relationship factors, individual factors, community factors, and social factors. Black et al. (1999) reviewed studies from North America on risk factors for physical domestic violence, and found that the likelihood of a man committing physical violence against his partner bears a direct relationship to youth and low income; to wit, younger men who make less money are likelier to commit physical violence against their partners than older wealthier men. Regarding the community factors, Hoffman et al. find socioeconomic status to be another significant factor affecting the male partner's probability of engaging in domestic violence. In North India, socio-demographic factors play a significant role in determining levels of male partner physical or sexual abuse (Martin et al., 1999). Another effect of the community factors is associated with how a particular community to responds to domestic violence. For instance, the extent to which a neighborhood helps a victim of domestic violence (either via moral pressure or legal avenues) may affect a given community's general level of domestic violence.

Levinson, Lipsey, and Derzon (1998) studied domestic violence against women across 90 different societies, and identified a cultural pattern of domestic violence that obtained across societies. According to their findings, in societies where men enjoy more bargaining power, due to their relatively higher economic decision-making power, there are more frequent occurrences of wife beating. Within such societies, women are generally unable to divorce easily; for example, women may send divorce requests to court, under certain extreme conditions, while men can divorce their wives easily. In such contexts, men use a different kind of violence to resolve their conflicts. In another study, Heise (1998) demonstrates that structural inequality, between men and women within a society, is one of the main reasons for domestic violence. He further illustrated that male honor, male aggressive behavior, and rigid gender-based roles increase the likelihood of gender-based violence. It is therefore possible to conclude that, in the most male-dominated and traditional societies, domestic violence derives from the male spouse's right to control different aspects of his wife's life, and is also heavily associated with conventional ideas about "acceptable" and "unacceptable" violence. For example, in some countries, some wives would not regard being forced to have sex by their current husbands as an act of sexual violence (Golu, 2013). In fact, both women and men in a society accept some kind of domestic violence as a social norm.

Egypt and Jordan are two Arab Middle East countries characterized by traditionally patriarchal

societies. In Egypt, according to Mashaly et al. (1994), 47% of female rape victims under a certain age are consequently murdered by male relatives, who regard the loss of female relatives' sexual purity in this way as tantamount to a loss of their own honor. Douki et al. (2003) show that in some Arab countries, including Egypt, the relative prevalence of domestic violence stems from a belief that domestic violence is a private problem and that the best way to protect the family honor is to remain silent. Another study, in 2000, of Ammar, Egypt, shows that high rates of domestic violence, alongside fewer chances of rescue or escape, leads some women to kill their husbands, resulting in problems for feminists aiming to protect women from domestic violence.

In Jordan, Kulwicky (2002) studied the effects of cultural context on domestic violence against women. She found that, among 89 homicide court files related to murders of women, 38 cases were related to "honor crimes," in the sense that the victims were women who were regarded as having violated the family honor. In another study of Jordan, (Clark et al., 2008) show a significant relationship between pregnancy avoidance by women and intimate partner violence.

These facts demonstrate the importance of studying the impact of inequality on domestic violence across such countries. On the other hand, there is a paucity of literature on domestic violence and its socioeconomic interpretations. In this paper, we examine the impact of socioeconomic inequality on domestic violence among Egyptian and Jordanian women, which has not been fully explored in the literature.

2- Literature Review:

Over the past decade, domestic violence in developing countries has become a growing concern among researchers and policymakers interested in women's health and social status. Although women in developing countries are subject to multiple types of violence, they confront domestic violence more commonly than other kinds of violence (Heise et al., 1994). Within Arab countries, there meaningful scarcity of literature about domestic violence, but the widely-acknowledged tendency, among Arab cultures, toward domestic violence and women abuse shows that the investigation about domestic violence is needed. Haj Yahia (1998) studied attitudes toward various issues related to domestic violence among a random sample of 625 participants (328 males and 297 females) in Palestine. In his study, 80% of men and women said

that the wife "isn't justified in reporting her husband's domestic violence to the legal authorities," which indicates that they regard domestic violence as an intra-familial problem, rather than a crime.

Table-1 reports women's beliefs regarding men's power as husbands in a family context, in Egypt and Jordan. For instance, 53% of women, aged 15 to 19 years, in Jordan agree that wife beating is justified when a wife insults her husband. In Egypt, 25% of women, aged 35 to 39 years think that, if a husband beats his wife when she goes out without his permission, he is right. One particularly surprising result is that 44.3% of woman in Jordan, between the ages of 15 and 19 years, believe that a husband is justified in hitting hit his wife if she does not feed him. Egypt and Jordan are two Arab developing countries, the population of which is largely Muslim characterized by majority populations of of Muslim people and traditional cultures associated with high rates of domestic violence. According to the 2012 Demographic and Health Survey (DHS) report for Jordan, around 36% of ever-married women, aged 15 to 49 years have reported experiencing both sexual and physical violence by their most recent partners.

Table 1- Percentage of women who are agree with the questions.

A husband is justified in hitting or beating his wife	Country	Jordan			Egypt		
	Year	2012			2014		
If she...	Insults Him	Does not feed him	Has relations with other men	Argues with him	Goes out without telling him	Refuses to have sexual intercourse with him	
Age	15-19	53.4	44.3	77.3	17.6	33.5	25
	20-24	38.1	26.8	70.2	13.6	28.1	19.5
	25-29	38	26.3	67.4	11	22.5	17
	30-34	37	23.2	65.6	12	24.6	19.7
	35-39	39.8	26.2	65.8	12.6	25	19.4
	40-44	37.4	22.6	62.4	12	25.4	19.5
	45-49	35.5	22.5	60.1	15.7	27.9	25.2

Source: DHS report for Egypt on 2014, and DHS report for Jordan on 2012

In Palestine, two national surveys were conducted, in the West Bank and the Gaza Strip, using systematic random sampling of 2,410 married Palestinian women in 1994, and 1,334 married woman in 1995. The results show that up to 34% of the women who participated in the first survey and 37% of the women who participated in the second survey reported experiencing at least one or more instances of physical violence in the 12 months prior to the survey (Haj Yahia, 2001). In Tunisia, a survey of 500 women, who consulted primary health care units in 1997, found that 33.8% had been beaten by their husbands or other male family members at least once (Belhaj and et al., 1998).

Domestic violence is a multidimensional problem, and each dimension contributes to the severity of the problem as a whole. One of the most significant dimensions of domestic violence involves a household's socioeconomic status. Studies conducted throughout regions of India have shown that women likelier to suffer beatings in households with fewer durable consumer goods (Jejeebhoy et al., 1997). In rural Bangladesh, Koenig et al. (2003) show that land ownership is negatively associated with the domestic violence against a wife or a family. Studies in North America have also shown that low levels of family income are always associated with physical abuse of the wife, but the relationship between male education is not consistent with such abuse (Smith, 1990).

In this context, wives' working status could be an indicator of both household socioeconomic situation and women's power, in a given society, as some scholars believe that women who are dependent on partnerships may be more tolerant of abuse, because they have children or are economically dependent, and therefore less willing to leave abusive relationships (Kalmuss, 1984); in such instances, the likelihood of domestic violence would increase. Studies of women in the United States have also shown that economic dependency of wives who are employed, earning less than 25% of the total household income, and have young children positively correlates with severe physical violence (Kalmuss & Straus, 1982). Conversely, among currently or previously married women in Kentucky, U.S., housewives are less likely to experience domestic violence during marriage than professional women, and life-threatening violence is more common in situations where the wife's educational and professional achievements exceed those of her husband (Carlton et al., 1981). DHS analytics studies from 2008 show that, in Bolivia, the Dominican Republic, and Zimbabwe, women who are not working (relative to those employed in non-agricultural jobs) are at less risk of experiencing physical violence from their

intimate partners; similarly, engaging in agricultural work has a protective effect on Bangladeshi women against physical violence, but is a risk factor for Malawi women. Therefore, the relationship between the working status of wives and domestic violence against them is differs across countries and societies.

On the other hand, education and media exposure have proven to be sources of empowerment for women, heightening their ability to collect and absorb information, manipulate all aspects of their environment in the modern world, and interact effectively with modern institutions (Caldwell, 1986; Kishor, 2000). In India, Jejeebhoy et al. (1997) found that the factors associated with wife-beating reflected women's powerlessness and their lack of education, a lack of control over resources, and the lack of alternatives to early marriage. In Bangladesh, Schuler et al. (1996) showed that an increase in wives education level could reduce the possibility of physical violence. Moreover, DHS reports related to Egypt reveal a negative relationship between women's education and physical violence.

Some studies indicate that additional household environmental parameters affect domestic violence (Honneth, 2006). In one case study, Erchak (1984) found that, in rural Liberia, domestic violence against wives tends to be met by neighbors' quick interference in family disputes. By contrast, in urban areas of Liberia, external interventions are less common and the incidence of domestic violence is higher. Therefore, the nature of women's residential areas also affects their risk of exposure to physical violence. Yount and Li (2009) found that, in Egypt, women who grew up in rural areas are 37% more likely to justify their husband's physical violence than women raised in urban areas. Subsequently, in 2010, they also showed that the higher percentage of women inclined to justify their husbands' acts of physical violence actually reflected higher levels of physical violence among rural women, relative to women living in urban areas (Yount & Li, 2010).

In this paper, we study the impact of inequality on domestic violence, across three groups of women representing three main indicators that may affect physical violence. Our key parameters for evaluating domestic violence are women's education level, women's residential area, and women's working status. To render this evaluation, we use the Demographic and Health Survey (DHS) self-report household survey for our selected countries, Egypt and Jordan; the measurement tool that we have selected to calculate the inequality in domestic violence is concentration index.

Concentration indices (CI) are now a fairly standard measure of equality, relative to inequality, in health and health economics literature. The concentration index was first introduced by Wagstaff et al. (1991) and has since been used frequently to describe and measure the degree of inequality in various health variables, as well as to evaluate health care achievements and shortfalls. The original concentration index has three main limitations, which results in two extensions of this index and one solution, to increase its explanatory power. Concentration index (CI), like the GINI coefficient, implies a set of value judgments about aversion to inequality; to make it explicit, Pereira (1998) and Wagstaff (2002) have introduced the “extended” concentration index, which allows for a clear understanding of inequality and an observation of how inequality changes as attitudes toward inequality change. The extended concentration index, using the aversion parameter, allows us to assess the health distribution rankings for different value judgments of socioeconomic health inequalities, including the one used in the conventional health concentration index.

The second shortcoming of the concentration index - and its generalization - is that it is only an indicator of inequality. While equity is an important health policy goal, it is not the only such policy goal. Policymakers may, in fact, be willing to measure and acknowledge the tradeoff between the health average and the inequality in health variable. This points to the second requisite expansion of the concentration index (Wagstaff, 2002): a “health achievement index” that reflects the performance of health system by considering the total level of health and the inequality of its distribution.

Although CI and its two expansions have been broadly applicable as a useful compound measuring tool, it still suffers from some limitations, with respect to scaling. When a selected health variable is measured as a non-negative ratio, the concentration index is an appropriate indicator for measuring socioeconomic-related health inequalities. However, health inequality is often measured by self-reported health indicators, rated in terms of categorical data, and the concentration index is not constant for any linear transformation of the health variable; adding a constant to a variable changes the value of the concentration index. As such, Allison and Foster (2004) introduced a method to obtain partial inequality ordering of self-assessed health distributions, involving assumption that when the probability mass deviates from the median and the inequality in the ordinal data increases, the so-called median hold difference occurs. They introduce a specific relationship into the distribution space, which embodies a concept more

equal in distribution than the other. Their method has two limitations: first, the inequalities of the two distributions can only be compared if their median categories coincide; and second, the method can compare total inequalities in the selected health variable, rather than socioeconomic-related inequalities.

Although various researchers have tried to address this issue, Makdissi and Yazbeck (2017) recently introduced the most powerful method, by which to find the robust identification of ordering for the selected health variable. Moreover, they identify the robust comparison of rank-dependent extended concentration index and health achievement index, based on the social weight proportion of the population in each health category.

In this paper, to measure inequality in physical violence from intimate partners, in Egypt and Jordan, using self-reported variables, the method developed by Makdissi and Yazbeck (2017) is used to find a robust ranking of socioeconomic health achievement and socioeconomic health inequality.

3- Methodology:

In this paper, we aim to measure the impact of socioeconomic disparity on domestic violence across Egypt and Jordan, using the most recent survey for both countries, conducted by DHS in 2014 and 2012, respectively. DHS collects information from households, using their self-report questionnaire, which provides us with categorical variables associated with physical violence. To estimate socioeconomic inequality reflected by the health variable results from health survey responses, we use the health concentration index, which quantifies the degree of socioeconomic disparities that inhere in a specific health variable. Health concentration indices are the most powerful measuring tool for comparing socioeconomic inequality. However, as noted above, these indices are sensitive to any linear nondecreasing transformation of cardinal to ordinal variables. To cope with this problem, Makdissi and Yazbeck (2017) proposed a method, assigning social weights to socioeconomic ranks, which results in robust rankings of relative and absolute socioeconomic inequality, as well as of socioeconomic health achievements.

To do so, let us suppose that N individuals respond to the survey; each individual would have a socioeconomic ranking as r_i , and the model would consider k physical violence category as h_i where $i \in \{1, 2, \dots, N\}$. The selected ill-health variable is ranked from the lowest level of physical

violence (e.g., a woman who has ever experienced her spouse twisting her arm or pulling her hair) to the highest level of this variable (e.g., a woman who has ever been a victim of burning or strangling by her spouse). Further, individuals are ranked on the basis of their wealth variable, from the lowest level standard of living to the highest.

In this paper, to find inequalities in domestic violence, three main indices were used: health achievement index $A(\nu)$, extended health concentration index $C(\nu)$, and generalized health concentration index $GC(\nu)$. The first step involved in calculating these indices is assigning a numerical scale to each category, by any nonnegative and linear scale, $\eta(h_k)$.

○ Extended Concentration Index:

Incorporating a parameter for aversion to socioeconomic inequality into the original concentration index results in the capture of different views on socioeconomic inequality aversion and the socioeconomic cost of disparities in health variable distribution. The extended concentration index (C), is a new class of concentration index that considers the parameter of socioeconomic aversion, as proposed by Pereira (1998) and Wagstaff (2002), which can therefore be used to measure relative socioeconomic inequality in the context of the selected health variable. It can be calculated as follows:

$$C(\nu) = \frac{1}{\mu_\eta} \sum_{i=1}^N w_c(r_i, \nu) \eta(h_i)$$

μ_η represents the average health status, and $w_c(r_i, \nu)$ are the socioeconomic weights related to the socioeconomic ranking and the socioeconomic health inequality aversion parameter, which should be $\nu > 1$.

$$w_c(r_i, \nu) = \frac{1}{N} - \frac{(N - r_i + 1)^\nu - (N - r_i)^\nu}{N^\nu}$$

○ Generalized Concentration Index:

The generalized concentration index is a tool to measure the “absolute socioeconomic health inequality,” which includes the parameter of socioeconomic aversion. It can be calculated using the following formula:

$$GC(v) = \sum_{i=1}^N w_c(r_i, v) \eta(h_i)$$

- Health Achievement Index:

This index is used to evaluate the performance of a health system, by measuring the total level of health, as well as disparities in the distribution of health variables. The following formula represents the index, under the condition that $v \geq 1$.

$$A(v) = \sum_{i=1}^N w_a(r_i, v) \eta(h_i)$$

Where, $w_a = \frac{(N-r_i+1)^v - (N-r_i)^v}{N^v}$

To apply the method developed by Makdissi and Yazbeck (2017), to find the robust ranking, there are four general steps involved in finding the socioeconomic health inequality and health achievement index in domestic violence:

Step one: Finding individual socioeconomic rank

Individuals have been ranked by their increasing wealth index. This means that we ranked them from the lowest level of wealth index (i.e., the poorest one) to the highest level of wealth index (i.e., the richest one). Considering wealth index helps us to capture the effect of income on physical violence within the selected household. We then find the socioeconomic rank P_i , which indicates the relative position of each individual in his or her society according to the following formula:

$$P_1 = \frac{\text{household weight}_1}{\text{sum of all household weights}}$$

$$P_2 = \frac{\text{household weight}_2}{\text{sum of all household weights}} + P_1$$

:

:

$$P_N = \frac{\text{household weight}_N}{\text{sum of all household weights}} + \sum_{i=1}^{N-1} P_i = 1$$

Step two: Finding ethical weights

Makdissi and Yazbeck proposed the following weights, to calculate those three extensions for concentration indices. They use w_a to measure the health achievement, and w_c to measure the generalized health concentration index,

$$w_a(P_i, \nu) = (1 - P_{i-1})^\nu - (1 - P_i)^\nu$$

$$w_c(P_i, \nu) = (P_i - P_{i-1}) - [(1 - P_{i-1})^\nu - (1 - P_i)^\nu]$$

The social weights are the weight of each individual with a particular socioeconomic rank in a particular physical violence category.

Step three: Finding cumulative social weight function

In this step, the cumulative social weights function (Φ^1) lets render a practical comparison of inequality between different selected groups. To achieve this goal, it is important to know whether the differences between physical domestic violence categories decrease in importance across different groups as we move toward the highest category. If moving toward the highest level of domestic violence results in minimal differences between levels of domestic violence across different groups, it makes sense to use a concave cumulative social weights function.

If the difference between health categories increases in importance as we move toward to the last one, it makes sense to use a convex cumulative social weight, which can be calculated by:

$$\begin{aligned} \Phi^1(K = 1) &= \sum_{i \in k} w_i \\ \Phi^1(2) &= \Phi^1(1) + \sum_{i \in k} w_i \\ &\vdots \\ \Phi^1(K) &= \Phi^1(k - 1) + \sum_{i \in k} w_i \end{aligned}$$

Step four: Interpretation

Different concentration indices can be defined in terms of one general formula, as follows:

$$I = \sum_{i=1}^N \omega(r_i) \eta(h_i)$$

or

$$I = \eta(h_k) - \sum_{k=1}^{k-1} \Delta^1 \eta(h_k) \Phi^1(K)$$

Where, $\Delta^1 \eta(h_k) = \eta(h_{k+1}) - \eta(h_k)$.

Therefore, the three selected indices would be:

- 1- The health achievement index:

$$A(v) = \eta(h_k) - \sum_k^{k-1} \Delta \eta(h_k) \phi_a(k)$$

Where $\phi_a(k)$ refers to the total social weights of $w_a(P_i, v)$, and $\eta(h_k)$ represents the numerical value of each category of health variable.

- 2- The generalized health concentration index:

$$GC(v) = \eta(h_k) - \sum_k^{k-1} \Delta \eta(h_k) \phi_c(k)$$

Where $\phi_c(k)$ refers to the total social weights of $w_c(P_i, v)$

- 3- The extended health concentration index:

$$C(v) = \frac{GC(v)}{A(v=1)}$$

To find the dominant category in each level of domestic violence for all of the indices, we can compare their cumulative social weights functions, given that $\Delta \eta(h_k) > 0$.

Therefore, for all convex and concave functions, an individual M has higher health achievements than individual N ($A(v)_M \geq A(v)_N$) for all $\eta(h_k)$, if

$$\emptyset_N^a \geq \emptyset_M^a$$

Where \emptyset^a shows the sum of social weights estimated by $w_a(P_i, \nu)$.

Conversely, an individual M has a higher absolute health inequality index than individual N, ($GC(\nu)_M \geq GC(\nu)_N$) for all $\eta(h_k)$, if :

$$\emptyset_M^c \geq \emptyset_N^c.$$

Where \emptyset^c shows the sum of social weights estimated by $w_c(P_i, \nu)$.

In the case of the extended health concentration index, an individual M has a higher extended health concentration index than individual ($C_M \geq C_N$), if:

- If $GC_1(\nu) \leq GC_2(\nu)$ for all $\eta(h)$ and all health levels under consideration, and $A(1)_1 \geq A(1)_2$ for all $\eta(h)$ under consideration, then distribution 1 dominates distribution 2
- If $GC_1(\nu) \leq GC_2(\nu)$ for all $\eta(h)$ and all health levels under consideration, and $A(1)_2 \geq A(1)_1$ for all $\eta(h)$ under consideration, then distribution 2 dominates distribution 1
- Otherwise, we cannot compare.

4- Data:

The Demographic and Health Survey (DHS) program uses household surveys to collect nationally representative information on topics such as domestic violence and gender-based issues, as well as information about child health. To collect data related to domestic violence against women, DHS use information from ever-married women at reproductive age. DHS also provides demographic characteristics, women's residential area, women's education level, and their working status. The survey asked women whether they had experienced physical violence from the most recent partner, during the 12 months preceding the survey.

For Egypt, the sample consists of 6,693 ever-married women asked about their experiences of domestic violence; in Jordan, 7,027 women were interviewed about physical violence.

Table 1 depicts the levels of physical violence, which have been ranked, from lower levels of physical violence to higher levels.

Table 2- Levels of physical violence

Category	Description	Level of Domestic Violence
5	Spouse ever tried to strangle, burn, or ever threatened with knife/gun or other weapon	
4	Spouse ever punch with fist or something harmful, or ever kicked or dragged	
3	Spouse ever slapped or ever twisted her arm or pulled her hair.	
2	Spouse ever pushed, shook or threw something	
1	Never experienced physical violence	

Table 3- percentage of women in each category of physical violence in Egypt and Jordan

Country	Physical violence categories	Frequency %
Egypt	1	74.97
	2	1.75
	3	14.99
	4	6.73
	5	1.56
Total		100
Jordan	1	79.22
	2	3.23
	3	8.14
	4	7.24
	5	2.18
Total		100

Source: DHS data on Egypt 2014 and Jordan 2012

Note: Numbers has been calculated using DHS weights

As Table 3 shows, about 25% of women in Egypt have experienced at least one kind of intimate partner physical violence. The most frequent form of physical violence against Egyptian wives involves acts that would fit into category 3 (e.g., spouse ever slapped or ever twisted her arm or

pulled her hair.); the least frequent types of physical violence are categories 2 and 5, which represent the lowest and the highest levels of physical violence, respectively.

In Jordan, based on the 2012 DHS report, 34% of ever-married women, between the ages of 15 and 49 years were subjected to at least one kind of physical violence. Moreover, based on Table 3, about 21% of these women report that intimate partners were responsible for committing that violence. As in Egypt, the most frequent form of physical violence is consistent with that described in category 3; the least frequent form of violence is associated with category 5. Considering the full picture, it is possible to observe a higher frequency of physical violence in Egypt than exists in Jordan.

Tables 4-6 show the percentages of women who experienced physical violence, on the basis of the aforementioned three demographic indicators: women's residential area, women's working status, and women's education level.

Table 4 illustrates the frequency of women's experience of physical violence in each category, based on their residential area (Urban vs. Rural). A comparison of the frequencies of physical violence in categories 2-5, between rural and urban areas; clearly shows that a higher rate of physical violence obtains in rural areas in Egypt. Conversely, lower rates of physical violence, across all categories, among women living in rural Jordan.

Table 4- Percentage of women, in each category, based on their residential area

Country	Physical violence categories	Type of residential area	
		Urban	Rural
Egypt	2	1.69	1.78
	3	13.87	15.62
	4	5.99	7.14
	5	1.79	1.43
	Total	23.34	25.97
Jordan	2	3.36	2.61
	3	8.26	7.52
	4	7.45	6.2
	5	2.41	1.01
	Total	21.48	17.34

Source: DHS data on Egypt 2014 and Jordan 2012

Note: Numbers has been calculated using DHS weights

Table 5 provides information about the percentage of women, in each category, who were subjected to physical violence in terms of their working status. Considering this demographical parameter also reflects completely opposite information deriving from these two countries.

Table 5- Percentage of women in each category based on their working status

Country	Physical violence categories	Type of working status	
		Not-Working	Working
Egypt	2	1.8	1.44
	3	14.94	15.32
	4	6.6	7.46
	5	1.57	1.49
	Total	24.91	25.71
Jordan	2	3.25	3.11
	3	8.55	6.05
	4	7.44	6.23
	5	2.12	2.43
	Total	21.36	17.82

Source: DHS data on Egypt 2014 and Jordan 2012

Note: Numbers has been calculated using DHS weights

The percentage of women experiencing various forms of physical violence in Jordan is lower among working wives than among wives who are not working. The opposite is true in Egypt, where working women suffer more physical violence, relative to wives who do not work.

Table 6 demonstrates the fact that, as women's education level increases, there is a decrease in the percentage of physical violence they experience; the exception consists of those women who have only a primary level of education, as these women manifestly suffer the highest percentage of physical violence across both countries.

Table 6- Percentage of women in each category based on their level of education

Country	Physical violence categories	Level of Education			
		None	Primary	Secondary	Higher
Egypt	2	1.78	1.01	1.92	1.59
	3	17.83	19.83	14.79	7.76
	4	9.64	9.31	6.17	2.29
	5	2.49	3.14	0.98	1.06
	Total	31.74	33.29	23.86	12.7
Jordan	2	1.79	1.37	3.41	3.43
	3	12.45	11.67	8.63	6.07
	4	6.57	14.92	7.94	4.11
	5	4.44	4.43	2.34	1.18
	Total	25.25	32.39	22.32	14.79

Source: DHS data on Egypt 2014 and Jordan 2012

Note: Numbers has been calculated using DHS weights

5- Results:

This section provides the results of a comparison of different distributions, using the cumulative social weights calculated on the basis of the method developed by Makdissi and Yazbeck (2017). Figure 1 illustrates the difference between two distributions of physical violence in rural (Red) and Urban (Blue) areas, in terms of health shortfalls in Jordan given the intermediate level of socioeconomic aversion where $\nu = 2$. Similarly, Figure 2 shows the difference, in terms of socioeconomic health inequality in Jordan where $\nu = 2$.

In the context of the health achievement index, all values are positive and the sum of all social weights equals 1. Conversely, socioeconomic health inequality can take both positive and negative values, the sum of all of which should equal zero. Positive values reflect a condition where physical violence is more concentrated among rich people, and negative values indicate that the health shortfalls are more concentrated among people who lack a high wealth ranking.

On the other hand, in the evaluation of health achievement depicted in Figure 1, the higher distribution dominates the lower one, and the assessment of socioeconomic health inequality, the lowest curve dominates the higher ones. Therefore, based on our results, in Jordan, rural areas have lower levels of failure regarding physical violence than urban areas, and socioeconomic health inequality in urban areas are higher, relative to rural area.

Figure 1- Comparing Health shortfall between rural and urban areas in Jordan

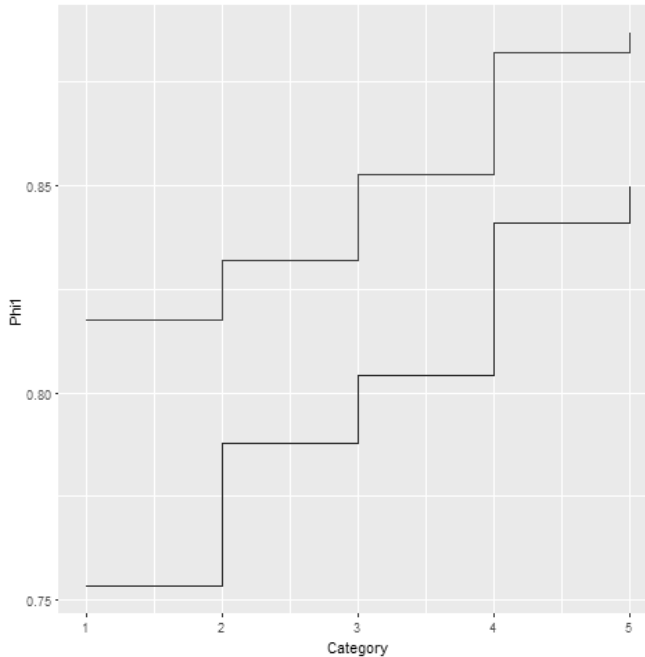
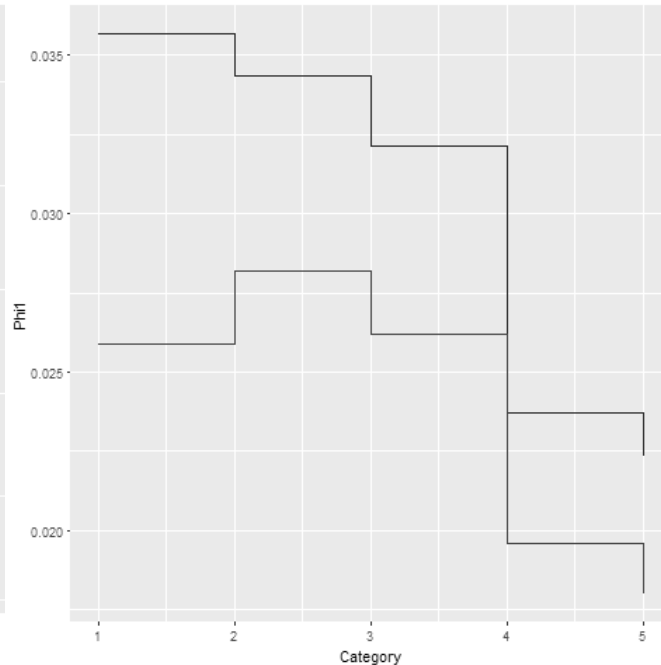


Figure 2- Comparing Socioeconomic inequality between rural and urban areas in Jordan



The following tables summarize all results based on their related figures, and provide the robust ordering for health shortfalls, as well as absolute and relative socioeconomic inequality. Table 7 indicates the robust ranking between the distribution of physical violence, in rural and urban areas, across Egypt and Jordan.

D means, the distribution which is in the Row dominates the distribution in the relative column for all values of socioeconomic aversion, and ND means we cannot compare.

The results show different behaviors in Egypt and Jordan across their rural and urban areas. In Egypt, rural areas have higher average levels of self-reported physical violence than urban areas; however, in Jordan, rural areas show lower average levels. In both countries, imposing convexity doesn't change our results.

To compare levels of absolute socioeconomic inequality, rural areas in both countries show less socioeconomic inequality than urban areas. Therefore, for Jordan, we can also conclude that rural areas show relatively less socioeconomic inequality than urban areas.

Table 7– Comparing health shortfalls and socioeconomic health inequality between Rural and Urban area in Jordan and Egypt

Country	Convex			Concave		
	A(v)			A(v)		
Jordan		Rural	Urban		Rural	Urban
	Rural		D	Rural		D
	Urban			Urban		
Egypt		Rural	Urban		Rural	Urban
	Rural			Rural		
	Urban	D		Urban	D	
	GC(v)			GC(v)		
Jordan		Rural	Urban		Rural	Urban
	Rural		D	Rural		D
	Urban			Urban		
Egypt		Rural	Urban		Rural	Urban
	Rural		D	Rural		D
	Urban			Urban		
	C(v)			C(v)		
Jordan		Rural	Urban		Rural	Urban
	Rural		D	Rural		D
	Urban			Urban		
Egypt		Rural	Urban		Rural	Urban
	Rural			Rural		ND
	Urban	ND		Urban		

Note: Dominance for $\nu = 1$ showed by 1; Dominance for $\nu = 2$ showed by 2; Dominance for $\nu = 3$ showed by 3; D means dominance for $\nu = 1, 2, 3$ for A(v), for GC(v), C(v), D means for $\nu = 2, 3$. ND means non-dominance. Dominance means that the row dominates the column, that is, there is less health inequality or health shortfall inequality in the row than in the column.

Comparisons between working and non-working wives in the context of experiencing physical violence, are summarized in Table 8. Like the comparisons based on the women’s residential areas, results concerning wives’ working status, between Egypt and Jordan, are different. In Jordan, the average physical violence sustained by working women is lower, relative to those women who are not working. As we increase the level of socioeconomic aversion, first to 2 and then to 3, results show the same difference. However, in Egypt, working women who are more in danger of suffering physical violence than non-working ones. In evaluating absolute socioeconomic inequality, working women demonstrate less socioeconomic inequality than non-

working ones. By contrast, in Egypt, working women seem to exhibit higher socioeconomic inequality than non-working women. In all of cases, imposing convexity yields the same results. Thus, in Jordan, working women have relatively less socioeconomic inequality than those women who are not working.

Table 8- Comparing health shortfalls and socioeconomic health inequality between working and non-working women in Jordan and Egypt

Country	Convex			Concave		
	A(v)			A(v)		
Jordan		Working	Not-Working		Working	Not-Working
	Working		D	Working		D
	Not-Working			Not-Working		
Egypt		Working	Not-Working		Working	Not-Working
	Working			Working		
	Not-Working	2,3		Not-Working	2,3	
	GC(v)			GC(v)		
Jordan		Working	Not-Working		Working	Not-Working
	Working		D	Working		D
	Not-Working			Not-Working		
Egypt		Working	Not-Working		Working	Not-Working
	Working			Working		
	Not-Working	D		Not-Working	D	
	C(v)			C(v)		
Jordan		Working	Not-Working		Working	Not-Working
	Working		D	Working		D
	Not-Working			Not-Working		
Egypt		Working	Not-Working		Working	Not-Working
	Working		ND	Working		
	Not-Working			Not-Working	ND	

Note: Dominance for $v = 1$ showed by 1; Dominance for $v = 2$ showed by 2; Dominance for $v = 3$ showed by 3; D means dominance for $v = 1, 2, 3$ for A(v), for GC(v), C(v), D means for $v = 2, 3$. ND means non-dominance. Dominance means that the row dominates the column, that is, there is less health inequality or health shortfall inequality in the row than in the column.

For both countries, in most cases, women with higher education levels are less likely to experience physical violence from their intimate partners, except those women with only a primary level of education, which is dominated by none across Egypt and Jordan. Imposing convex distributions over assessments of women’s education yields more powerful results.

Table 9- Comparing health shortfalls and socioeconomic health inequality among wives' different levels of education in Egypt and Jordan

Country	A(v)					A(v)				
		None	Primary	Secondary	Higher		None	Primary	Secondary	Higher
Jordan	None		D			None		D		
	Primary					Primary				
	Secondary		D			Secondary	D	D		
	Higher	D	D	D		Higher	D	D	D	
		None	Basic	Secondary	Higher		None	Basic	Secondary	Higher
Egypt	None		1			None		1		
	Basic					Basic	3			
	Secondary	D	D			Secondary	D	D		
	Higher	D	D	D		Higher	D	D	D	
		GC(v)					GC(v)			
Jordan	None					None				
	Primary					Primary	D		2	
	Secondary	3				Secondary	D			
	Higher	D	D	D		Higher	D	D	D	
		None	Basic	Secondary	Higher		None	Basic	Secondary	Higher
Egypt	None					None				
	Basic	D		2	D	Basic	D		D	D
	Secondary	D			D	Secondary	D			D
	Higher	3				Higher	D			
		C(v)					C(v)			
Jordan	None					None				
	Primary	ND				Primary				
	Secondary	ND	ND			Secondary	D			
	Higher	D	D	D		Higher	D	D	D	
		None	Basic	Secondary	Higher		None	Basic	Secondary	Higher
Egypt	None					None				
	Basic					Basic				
	Secondary	D				Secondary	D			
	Higher	3				Higher	D			

Note: Dominance for $\nu = 1$ showed by 1; Dominance for $\nu = 2$ showed by 2; Dominance for $\nu = 3$ showed by 3; D means dominance for $\nu = 1, 2, 3$ for A(v), for GC(v), C(v), D means for $\nu = 2, 3$. ND means non-dominance. Dominance means that the row dominates the column, that is, there is less health inequality or health shortfall inequality in the row than in the column.

6- Conclusion:

In this paper, we have used the dominance approach proposed by Makdissi and Yazbeck (2017), to assess inequality's impact on domestic violence in two Arab developing countries, Egypt and Jordan. Using this method, we conducted an analysis of socioeconomic health inequality, using categorical self-reported data, on the basis of finding the total social weights within each health category. The general form of the numerical scale, both concave and convex numerical scales, enables us to obtain a complete robust ordering that accounts for the socioeconomic dimension of health inequality's impact on domestic violence

The results illustrate that rural areas in Jordan, relative to urban areas, show higher levels of inequality in domestic violence, which are accompanied by higher shortfalls in the health system. Results for Egypt indicate higher inequality in domestic violence in urban areas, relative to rural areas. Women who work for money in Egypt are at higher risk of domestic violence and also suffer from higher shortfalls in the health system. Conversely, non-working women in Jordan experience higher levels of domestic violence, as well as higher health shortfalls. The third context of comparison, level of education, in both countries, generally shows less socioeconomic health inequality in terms of domestic violence as the level of women education increases. In future research, it would be interesting to adopt a distribution regression approach to find more information related to socioeconomic inequality and its impact on domestic violence within these two countries, which exhibit meaningfully different results in the comparisons of rural and urban, and working and non-working women.

7- References:

Allison, R. A., & Foster, J. E. (2004). Measuring health inequality using qualitative data. *Journal of health economics*, 23(3), 505-524.

Aloui, Touhami, Ayed, M., & Fourati, H. (1989). Enquête Démographique et de Santé en Tunisie 1988. Office National de la Famille et de la Population Direction de la Population/Tunisie and Institute for Resource Development/Macro Systems. Available at <http://dhsprogram.com/pubs/pdf/FR40/FR40.pdf>.

Ammar, N. H. (2000). In the shadow of the pyramids: Domestic violence in Egypt. *International Review of Victimology*, 7(1-3), 29-46.

Belhaj, A., & Hachmi, Z. (1998). Les épouses battues: enquête dans un centre de santé de base en Tunisie. *Journal Tunisien de Psychiatrie*, 1(1).

- Black, D. A., Schumacher, J. A., Slep, A. S., & Heyman, R. E. (1999). Partner, child abuse risk factors literature review. *National Network of Family Resiliency, National Network for Health*.
- Caldwell, J. C. (1986). Routes to low mortality in poor countries. *Population and development review*, 171-220.
- Clark, C. J., Silverman, J., Khalaf, I. A., Abu Ra'ad, B., Abu Al Sha'ar, Z., Abu Al Ata, A., & Batiha, A. (2008). Intimate partner violence and interference with women's efforts to avoid pregnancy in Jordan. *Studies in family planning*, 39(2), 123-132.
- de la Familia, A. P. B., & PROFAMILIA, C. (1995). Colombia: Encuesta nacional de demografía y salud 1995. In *Colombia: Encuesta nacional de demografía y salud 1995*. Colombia. PROFAMILIA.
- Douki, S., Nacef, F., Belhadj, A., Bouasker, A., & Ghachem, R. (2003). Violence against women in Arab and Islamic countries. *Archives of women's mental health*, 6(3), 165-171.
- Ellsberg, M. C., Pena, R., Herrera, A., Liljestrand, J., & Winkvist, A. (1999). Wife abuse among women of childbearing age in Nicaragua. *American journal of public health*, 89(2), 241-244.
- El-Zanaty, F., & ICF International. (2015). Egypt Demographic and Health Survey 2014. Ministry of Health and Population and ICF International. Available at <http://dhsprogram.com/pubs/pdf/FR302/FR302>.
- El-Zanaty, F., & Way, A. A. (2001). Egypt Demographic and Health Survey 2000.
- Erchak, G. M. (1984). Cultural anthropology and spouse abuse. *Current Anthropology*, 25(3), 331-332.
- Golu, F. (2014). Predictors of domestic violence—comparative analysis. *Procedia-Social and Behavioral Sciences*, 127, 611-615.
- Haj-Yahia, M. M. (1998). A patriarchal perspective of beliefs about wife beating among Palestinian men from the West Bank and the Gaza Strip. *Journal of Family Issues*, 19(5), 595-621.
- Haj-Yahia, M. M. (2001). The incidence of witnessing interparental violence and some of its psychological consequences among Arab adolescents. *Child Abuse & Neglect*, 25(7), 885-907.
- Haj-Yahia, M. M., & Edleson, J. L. (1994). Predicting the use of conflict resolution tactics among engaged Arab-Palestinian men in Israel. *Journal of Family Violence*, 9(1), 47-62.
- Heise, L. L. (1998). Violence against women: an integrated, ecological framework. *Violence against women*, 4(3), 262-290.
- Heise, L. L., Pitanguy, J., & Germain, A. (1994). Violence against women. The hidden health burden.
- Hindin, M. J., Kishor, S., & Ansara, D. L. (2008). Intimate partner violence among couples in 10 DHS countries: predictors and health outcomes.
- Holden, G. W. (2003). Children exposed to domestic violence and child abuse: Terminology and taxonomy. *Clinical child and family psychology review*, 6(3), 151-160.
- Honneth, A. (2006). *Kamp om anerkendelse: Sociale konflikters moralske grammatik*. Hans Reitzel.

- Hornung, C. A., McCullough, B. C., & Sugimoto, T. (1981). Status relationships in marriage: Risk factors in spouse abuse. *Journal of Marriage and the Family*, 675-692.
- Jejeebhoy, S. J., & Cook, R. J. (1997). State accountability for wife-beating: the Indian challenge. *The Lancet*, 349, S10-S12.
- Jewkes, R., Penn-Kekana, L., Levin, J., Ratsaka, M., & Schriber, M. (2001). Prevalence of emotional, physical and sexual abuse of women in three South African provinces. *South African medical journal*, 91(5), 421-428.
- Kalmuss, D. (1984). The intergenerational transmission of marital aggression. *Journal of Marriage and the Family*, 11-19.
- Kalmuss, D. S., & Straus, M. A. (1982). Wife's marital dependency and wife abuse. *Journal of Marriage and the Family*, 277-286.
- Kishor, S. (1995). Autonomy and Egyptian women: findings from the 1988 Egypt Demographic and Health Survey.
- Kishor, S. (2000). Empowerment of women in Egypt and links to the survival and health of their infants.
- Kishor, S., & Johnson, K. (2004). Profiling domestic violence: a multi-country study.
- Koenig, M. A., Ahmed, S., Hossain, M. B., & Mozumder, A. K. A. (2003). Women's status and domestic violence in rural Bangladesh: individual-and community-level effects. *Demography*, 40(2), 269-288.
- Krug, E. G., Mercy, J. A., Dahlberg, L. L., & Zwi, A. B. (2002). The world report on violence and health. *The lancet*, 360(9339), 1083-1088.
- Kulwicki, A. D. (2002). The practice of honor crimes: A glimpse of domestic violence in the Arab world. *Issues in mental health nursing*, 23(1), 77-87.
- Langhinrichsen-Rohling, J. (2010). Controversies involving gender and intimate partner violence in the United States. *Sex Roles*, 62(3-4), 179-193.
- Lipsey, M. W., & Derzon, J. H. (1998). Predictors of violent or serious delinquency in adolescence and early adulthood: a synthesis of longitudinal research.
- Makdissi, P., & Yazbeck, M. (2017). Robust rankings of socioeconomic health inequality using a categorical variable. *Health economics*, 26(9), 1132-1145.
- Martin, S. L., Tsui, A. O., Maitra, K., & Marinshaw, R. (1999). Domestic violence in northern India. *American journal of epidemiology*, 150(4), 417-426.
- Mashaly, A. Y., Graitcer, P. L., & Youssef, Z. M. (1993). Injury in Egypt: an analysis of injuries as a health problem.
- Morse, B. J. (1995). Beyond the Conflict Tactics Scale: Assessing gender differences in partner violence. *Violence and victims*, 10(4), 251.
- Pereira, J. A. (1998). Inequality in infant mortality in Portugal, 1971-1991. In *Health, the Medical Profession, and Regulation*(pp. 75-93). Springer, Boston, MA.

- Schuler, S. R., Hashemi, S. M., Riley, A. P., & Akhter, S. (1996). Credit programs, patriarchy and men's violence against women in rural Bangladesh. *Social science & medicine*, 43(12), 1729-1742.
- Smith, M. D. (1990). Sociodemographic risk factors in wife abuse: Results from a survey of Toronto women. *Canadian Journal of Sociology/Cahiers canadiens de sociologie*, 39-58.
- Straus, M. A. (2004). Prevalence of violence against dating partners by male and female university students worldwide. *Violence against women*, 10(7), 790-811.
- Swan, S. C., Gambone, L. J., Caldwell, J. E., Sullivan, T. P., & Snow, D. L. (2008). A review of research on women's use of violence with male intimate partners. *Violence and victims*, 23(3), 301-314.
- Wagstaff, A. (2002). *Inequality aversion, health inequalities, and health achievement*. The World Bank.
- Wagstaff, A., Paci, P., & Van Doorslaer, E. (1991). On the measurement of inequalities in health. *Social science & medicine*, 33(5), 545-557.
- World Health Organization. (2005). WHO multi-country study on women's health and domestic violence against women: initial results on prevalence, health outcomes and women's responses.
- Yount, K. M., & Li, L. (2009). Women's "justification" of domestic violence in Egypt. *Journal of Marriage and Family*, 71(5), 1125-1140.
- Yount, K. M., & Li, L. (2010). Domestic violence against married women in Egypt. *Sex roles*, 63(5-6), 332-347.